

# Compacting the Curriculum for Algebra in the Middle Grades

Kristin Arterbury, M.S.Ed.

[karterbury@esc12.net](mailto:karterbury@esc12.net)

254-495-9532



# The Impetus...

- ▶ New High School Math Standards
  - ▶ Adopted in April 2012
  - ▶ Implemented in 2015-2016
  - ▶ Required Prerequisites now listed in the TEKS effective 2015-106

# High School Math Prerequisites



## High School Prerequisites

Course	Prerequisite	Course	Prerequisite
<a href="#">Algebra I</a>	Grade 8 Math or its equivalent	<a href="#">Statistics</a>	Algebra I
<a href="#">Algebra II</a>	Algebra I	<a href="#">Precalculus</a>	Algebra I, Geometry, and Algebra II
<a href="#">Geometry</a>	Algebra I	<a href="#">Adv. Quantitative Reasoning</a>	Geometry and Algebra II
<a href="#">Mathematical Models with Applications</a>	Algebra I	<a href="#">Independent Study in Mathematics</a>	Geometry and Algebra II
<a href="#">Algebraic Reasoning</a>	Algebra I	<a href="#">Discrete Mathematics for Problem Solving</a>	Algebra II

# Algebra in the Middle Grades

- We have a prerequisite that wasn't there prior to 2015-2016

## OLD Algebra I

### **§111.32. Algebra I (One Credit).**

- (a) Basic understandings.
  - (1) Foundation concepts for high school mathematics. As presented in Grades K-8, the basic understandings of number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking;

## NEW Algebra I

### **§111.39. Algebra I, Adopted 2012 (One Credit).**

- (a) General requirements. Students shall be awarded one credit for ~~successful completion of this course~~. This course is recommended for students in Grade 8 or 9. Prerequisite: Mathematics, Grade 8 or its equivalent

## Percent of new content in 2014-15 Mathematics TEKS

Math 6		Math 7		Math 8	
	# of TEKS		# of TEKS		# of TEKS
Current Math 6	23	Current Math 6	<b>1</b>	Current Math 6	
Current Math 7	<b>7</b>	Current Math 7	25	Current Math 7	<b>1</b>
Current Math 8	<b>5</b>	Current Math 8	<b>8</b>	Current Math 8	27
Current Algebra 1	<b>3</b>	Current Algebra 1		Current Algebra 1	<b>8</b>
Current Geometry		Current Geometry		Current Geometry	<b>5</b>
Current Algebra 2		Current Algebra 2		Current Algebra 2	
Current Pre-Cal		Current Pre-Cal		Current Pre-Cal	
Brand New TEKS	<b>13</b>	Brand New TEKS	<b>7</b>	Brand New TEKS	<b>3</b>
% new content to grade level	<b>55%</b>	% new content to grade level	<b>39%</b>	% new content to grade level	<b>39%</b>



Algebra 1		Geometry		Algebra 2	
	# of TEKS		# of TEKS		# of TEKS
Current Math 6		Current Math 6		Current Math 6	
Current Math 7		Current Math 7		Current Math 7	
Current Math 8	<b>1</b>	Current Math 8	<b>1</b>	Current Math 8	
Current Algebra 1	30	Current Algebra 1		Current Algebra 1	
Current Geometry	<b>1</b>	Current Geometry	32	Current Geometry	
Current Algebra 2	<b>6</b>	Current Algebra 2	<b>1</b>	Current Algebra 2	35
Current Pre-Cal	<b>2</b>	Current Pre-Cal		Current Pre-Cal	<b>3</b>
Brand New TEKS	<b>6</b>	Brand New TEKS	<b>8</b>	Brand New TEKS	<b>2</b>
% new content to grade level	<b>35%</b>	% new content to grade level	<b>24%</b>	% new content to grade level	<b>13%</b>

# Grades 5<sup>th</sup> and 6<sup>th</sup> STAAR Blueprint

Reporting Categories	Number of Standards		Number of Standards	
<b>Reporting Category 1: Numerical Representations and Relationships</b>	Readiness Standards	2	Readiness Standards	4
	Supporting Standards	4	Supporting Standards	11
	Total	6	Total	15
<b>Reporting Category 2: Computations and Algebraic Relationships</b>	Readiness Standards	6	Readiness Standards	6
	Supporting Standards	9	Supporting Standards	11
	Total	15	Total	17
<b>Reporting Category 3: Geometry and Measurement</b>	Readiness Standards	3	Readiness Standards	3
	Supporting Standards	5	Supporting Standards	3
	Total	8	Total	6
<b>Reporting Category 4: Data Analysis and Personal Financial Literacy</b>	Readiness Standards	1	Readiness Standards	3
	Supporting Standards	6	Supporting Standards	10
	Total	7	Total	13
<b>Readiness Standards</b>	<b>Total Number of Standards</b>	<b>12</b>	<b>Total Number of Standards</b>	<b>16</b>
<b>Supporting Standards</b>	<b>Total Number of Standards</b>	<b>24</b>	<b>Total Number of Standards</b>	<b>35</b>

# Grades 6<sup>th</sup> and 7<sup>th</sup> STAAR Blueprint

Reporting Categories	Number of Standards		Number of Standards	
<b>Reporting Category 1: Numerical Representations and Relationships</b>	Readiness Standards	4	Readiness Standards	2
	Supporting Standards	11	Supporting Standards	5
	Total	15	Total	7
<b>Reporting Category 2: Computations and Algebraic Relationships</b>	Readiness Standards	6	Readiness Standards	5
	Supporting Standards	11	Supporting Standards	7
	Total	17	Total	12
<b>Reporting Category 3: Geometry and Measurement</b>	Readiness Standards	3	Readiness Standards	4
	Supporting Standards	3	Supporting Standards	5
	Total	6	Total	9
<b>Reporting Category 4: Data Analysis and Personal Financial Literacy</b>	Readiness Standards	3	Readiness Standards	2
	Supporting Standards	10	Supporting Standards	8
	Total	13	Total	10
<b>Readiness Standards</b>	<b>Total Number of Standards</b>	<b>16</b>	<b>Total Number of Standards</b>	<b>13</b>
<b>Supporting Standards</b>	<b>Total Number of Standards</b>	<b>35</b>	<b>Total Number of Standards</b>	<b>25</b>



# Grades 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> STAAR Blueprint

Reporting Categories	Number of Questions		Number of Questions		Number of Questions	
Reporting Category 1: Numerical Representations and Relationships	8		14		9	
Reporting Category 2: Computations and Algebraic Relationships	24		20		20	
Reporting Category 3: Geometry and Measurement	12		8		16	
Reporting Category 4: Data Analysis and Personal Financial Literacy	6		10		9	
Readiness Standards	60%–65%	30–33	60%–65%	31–34	60%–65%	32–35
Supporting Standards	35%–40%	17–20	35%–40%	18–21	35%–40%	19–22

# Grade 8 STAAR Blueprint

Reporting Categories	Number of Standards		Number of Questions	
<b>Reporting Category 1: Numerical Representations and Relationships</b>	Readiness Standards	1	<b>5</b>	
	Supporting Standards	3		
	Total	4		
<b>Reporting Category 2: Computations and Algebraic Relationships</b>	Readiness Standards	5	<b>22</b>	
	Supporting Standards	9		
	Total	14		
<b>Reporting Category 3: Geometry and Measurement</b>	Readiness Standards	5	<b>20</b>	
	Supporting Standards	9		
	Total	14		
<b>Reporting Category 4: Data Analysis and Personal Financial Literacy</b>	Readiness Standards	2	<b>9</b>	
	Supporting Standards	6		
	Total	8		
<b>Readiness Standards</b>	<b>Total Number of Standards</b>	<b>13</b>	<b>60%–65%</b>	<b>34–36</b>
<b>Supporting Standards</b>	<b>Total Number of Standards</b>	<b>27</b>	<b>35%–40%</b>	<b>20–22</b>
<b>Total Number of Questions on Test</b>			<b>52 Multiple Choice 4 Griddable 56 Total</b>	

# Algebra STAAR Blueprint

Reporting Categories	Number of Standards		Number of Questions	
<b>Reporting Category 1: Number and Algebraic Methods</b>	Readiness Standards	2	<b>11</b>	
	Supporting Standards	11		
	Total	13		
<b>Reporting Category 2: Describing and Graphing Linear Functions, Equations, and Inequalities</b>	Readiness Standards	3	<b>12</b>	
	Supporting Standards	8		
	Total	11		
<b>Reporting Category 3: Writing and Solving Linear Functions, Equations, and Inequalities</b>	Readiness Standards	5	<b>14</b>	
	Supporting Standards	7		
	Total	12		
<b>Reporting Category 4: Quadratic Functions and Equations</b>	Readiness Standards	4	<b>11</b>	
	Supporting Standards	4		
	Total	8		
<b>Reporting Category 5: Exponential Functions and Equations</b>	Readiness Standards	2	<b>6</b>	
	Supporting Standards	3		
	Total	5		
<b>Readiness Standards</b>	<b>Total Number of Standards</b>	<b>16</b>	<b>60%–65%</b>	<b>32–35</b>
<b>Supporting Standards</b>	<b>Total Number of Standards</b>	<b>33</b>	<b>35%–40%</b>	<b>19–22</b>
<b>Total Number of Questions on Test</b>			<b>49 Multiple Choice 5 Griddable 54 Total</b>	

# Texas Administrative Code 74.11

- ▶ (j) A student may not be enrolled in a course that has a required prerequisite unless:
  - ▶ (1) the student has successfully completed the prerequisite course(s);
  - ▶ (2) the student has demonstrated equivalent knowledge as determined by the school district; or
  - ▶ (3) the student was already enrolled in the course in an out-of-state, an out-of-country, or a Texas nonpublic school and transferred to a Texas public school prior to successfully completing the course.
- ▶ (k) A district may award credit for a course a student completed without meeting the prerequisites if the student completed the course in an out-of-state, an out-of-country, or a Texas nonpublic school where there was not a prerequisite.

# Foundation Plan & RHSP

- ▶ The law applies to both the Foundation Plan 74.11(a)(1) and the Recommended High School Program 74.71(c).



# Chapter 74. Curriculum Requirements

## Subchapter C. Other Provisions

- ▶ (c) Assessment for course credit in Grades 6-12.
- ▶ (1) A school district board of trustees shall approve for each high school course, to the extent available, at least four examinations.
  - ▶ (A) The examinations shall include:
    - ▶ (i) College Board advanced placement examinations; and
    - ▶ (ii) examinations administered through the College-Level Examination Program.
  - ▶ (B) The examinations may include examinations developed by:
    - ▶ (i) Texas Tech University;
    - ▶ (ii) The University of Texas at Austin;
    - ▶ (iii) the school district; and
    - ▶ (iv) another entity if the assessment meets all of the requirements in paragraph (2) of this subsection.

# Chapter 74. Curriculum Requirements

## Subchapter C. Other Provisions

- ▶ (2) In order for a school district to administer a district-developed examination or an examination under paragraph (1)(B)(iv) of this subsection for credit, prior to the first administration, the school district must certify that the examination:
  - ▶ (A) covers all assessable Texas essential knowledge and skills for the course;
  - ▶ (B) has not been published and is not publicly available;
  - ▶ (C) will only be administered in a secure environment under standardized conditions by a school district or institution of higher education;
  - ▶ (D) has been externally validated;
  - ▶ (E) is equivalent to state level end-of-course assessment instruments in terms of content coverage, item difficulty, and technical quality;
  - ▶ (F) yields comparable results for all subgroups; and
  - ▶ (G) if for a course that has a state level end-of-course assessment instrument, is validated against the applicable end-of-course assessment. For an examination that is validated for this purpose, a school district must make public:
    - ▶ (i) the test development process; and
    - ▶ (ii) the results of the validation efforts.

# Chapter 74. Curriculum Requirements

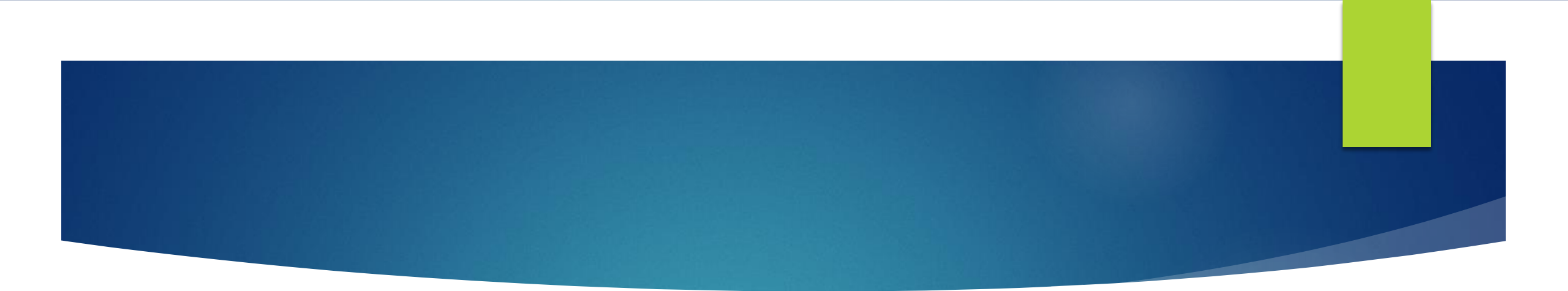
## Subchapter C. Other Provisions

- ▶ (2) In order for a school district to administer a district-developed examination or an examination under paragraph (1)(B)(iv) of this subsection for credit, prior to the first administration, the school district must certify that the examination:
  - ▶ (A) covers all assessable Texas essential knowledge and skills for the course;
  - ▶ (B) has not been published and is not publicly available;
  - ▶ (C) will only be administered in a secure environment under standardized conditions by a school district or institution of higher education;
  - ▶ (D) has been externally validated;
  - ▶ (E) is equivalent to state level end-of-course assessment instruments in terms of content coverage, item difficulty, and technical quality;
  - ▶ (F) yields comparable results for all subgroups; and
  - ▶ (G) if for a course that has a state level end-of-course assessment instrument, is validated against the applicable end-of-course assessment. For an examination that is validated for this purpose, a school district must make public:
    - ▶ (i) the test development process; and
    - ▶ (ii) the results of the validation efforts.

# Chapter 74. Curriculum Requirements

## Subchapter C. Other Provisions

- ▶ (5) A student in any of Grades 6-12 must be given credit for an academic subject in which he or she has had no prior instruction if the student scores:
  - ▶ (A) a three or higher on a College Board advanced placement examination that has been approved by the school district board of trustees for the applicable course;
  - ▶ (B) a scaled score of 50 or higher on an examination administered through the College-Level Examination Program and approved by the school district board of trustees for the applicable course; or
  - ▶ (C) 80% on any other criterion-referenced test approved by the school district board of trustees for the applicable course.

- 
- ▶ (8) If a student is given credit in accordance with paragraph (5) of this subsection in a subject on the basis of an examination on which the student scored 80% or higher, the school district must enter the examination score on the student's transcript, and the student is not required to take an applicable end-of-course assessment instrument for the course.
  - ▶ (9) In accordance with local school district policy, a student in any of Grades 6-12 may be given credit for an academic subject in which he or she had some prior instruction if the student scores 70% on a criterion-referenced test approved by the school district board of trustees for the applicable course.



# Backing into a Solution

	3 <sup>rd</sup> Grade	4 <sup>th</sup> Grade	5 <sup>th</sup> Grade	6 <sup>th</sup> Grade	7 <sup>th</sup> Grade	8 <sup>th</sup> Grade
					8 <sup>th</sup> Grade Math	Algebra I

# Wikispace

- ▶ alg1ms.wikispaces.com
- ▶ WiFi: T3@ch@R12

# Table Conversations

- ▶ Study, contemplate and be ready to share and discuss
  - ▶ Table 1: 4-10
  - ▶ Table 2: 11-17
  - ▶ Table 3: 18-24
  - ▶ Table 4: 25-32
  - ▶ Table 5: 33-40
  - ▶ Table 6: 41-48

